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GROUND WATER AND SURFACE WATER
POLLUTION SURVEY
Of The
VILLAGE OF KILLALOE STATION
In The
COUNTY OF RENFREW
DISTRICT ENGINEERS SECTION
1972

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Ground water and surface water
pollution survey of the village of
Killaloe Station in the county of
Renfrew.

78425

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Ref. 72877
MINISTRY OF THE ENVIRONMENT

275 Ontario Street, Kingston, Ontario. K7K 2X5 546-3171

ENTERED JUN 24 2003

Mrs. J. G. Cybulski, Clerk-Treasurer,
Village of Killaloe Station,
Box 159,
Killaloe Station, Ontario.

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Dear Mrs. Cybulski:

Re: Village of Killaloe Station
Water Pollution Survey

We are pleased to submit a report on a survey of surface and ground water quality conditions in the Village of Killaloe Station, together with the results and recommendations of our investigations. The recommendations are as follows:

- 1) The Municipality should continue with their efforts to ensure that a communal sewage system is installed at the earliest date possible.
- 2) Public preference should dictate the domestic water supply; a communal water system or individual private wells.

After council has had an opportunity to review the report, we would be pleased to meet and discuss at their convenience any points which have risen.

Yours very truly,

L. G. South, P. Eng.,
Regional Engineer,
Sanitary Engineering Branch.

RAD/lc

Encl.

GROUND WATER AND SURFACE WATER

POLLUTION SURVEY

Of The

VILLAGE OF KILLALOE STATION

In The

COUNTY OF RENFREW

1972

GROUND WATER AND SURFACE WATER

POLLUTION SURVEY

Of The

VILLAGE OF KILLALOE STATION

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INTRODUCTION

This report, on the ground water and surface water conditions in the Village of Killaloe Station, has been completed from data gathered from a survey carried out on September 26, 1972 by staff from the Renfrew County Health Unit and Ministry of the Environment. This report will take into consideration reports prepared by the Ontario Water Resources Commission in 1966 and 1969. It is intended to outline the extent of the pollution problems in the village and make specific recommendations within the context of reasonable guidelines to correct them.

ACKNOWLEDGEMENTS

The Ministry of the Environment is indebted to Mr. J. Watt, Director of Environmental Health Division, Renfrew County Health Unit and his staff for assistance provided during the survey. Advice and information provided by Mrs. J. G. Cybulski was also deeply appreciated.

POPULATION

According to the 1972 Municipal Directory, the population of Killaloe Station is 811. Based on a growth rate of $1\frac{1}{2}\%$ per annum, the population of the village in 1990 will be 1,158. Without services the growth rate would probably be closer to $\frac{1}{2}\%$.

LOCATION

The Village of Killaloe Station is located on Highway # 512 south of the easterly junction of Highways # 60 and # 62.

GENERAL CHARACTERISTICS OF THE CREEK AREA

Brennan Creek and Brudenell Creek flowing in a northerly direction converge at Killaloe and continue following a northerly direction through

the Village of Killaloe Station and eventually into Golden Lake. In the report, the writer has referred to Brennan's Creek as the body of water flowing through the village. The drainage area of the creek is 69.7 square miles.

In 1971 the average daily mean flow for 153 days (June-November) was 18.1 c.f.s. (cubic foot per second) while the minimum flow was 6.2 c.f.s. (August 13, 1971). Reportedly, there are times when the flow is less than one cubic foot per second.

TOPOGRAPHY AND SOIL CONDITIONS

The rock strata underlying the unconsolidated sediments in the area is primarily granite. On the east side of Brennan's Creek rock outcrops of the Monteagle-rock complex can be observed. Soil overburden is very shallow averaging one to three feet.

On the west side of Brennan's Creek soil of the Uplands Series is predominant. Such deposits are in general fine to very fine sands partly a result of stream outwash and therefore are usually not well graded. The topography is level to gentle undulating.

EXISTING SERVICES

At present, the residents rely on subsurface systems to treat domestic waste. Based on the parameters of depth of soil to bedrock, soil type, and topography, it can be concluded that east of Brennan's Creek difficulties will occur with the septic tank system. In the built up area of the village, especially along Lake Street, buildings are located on the banks of the creek and waste disposal systems operating in this section would be highly suspicious. In fact, direct discharges to Brennan's Creek have been reported. The size of many lots scattered throughout the village are of an insufficient size to support a well and septic tank system under present day standards. In summary, sewage disposal systems east of Brennan's Creek are generally inadequate

thereby indirect or direct discharges to the ground water and surface water are occurring.

Although soil of the Uplands Series west of the creek is classified as being adequate for the installation of subsurface systems, many wells sampled during the survey were found to be adverse which prompted the writer to look further into the compiled data and results. The conclusions of the survey will be outlined further in the report.

Individual wells in the Village of Killaloe Station with capacities ranging from one to ten gallons per minute are predominant. Pollution of shallow wells has resulted in the provision of several "community wells" from which residents carry water for domestic purposes.

WATER USES

Brennan's Creek is used for minor recreational activities.

METHOD OF STUDY

The method of study consisted of the following:

- 1) reviewing Ministry files and notes
- 2) discussions with municipal and health unit officials
- 3) review of consultant's reports on servicing for the village
- 4) field reconnaissance of the creek and village
- 5) sampling of private wells in the village
- 6) sampling of water courses within the limits of Killaloe Station.

RESULTS OF WELL SURVEY

Staff attempted to secure a bacteriological sample from each well in the village. The samples were sent to the Ministry of Health Laboratory in Ottawa immediately after collection and analyzed according to "Standard Methods". Some 129 wells were sampled representing approximately 70% of the total. The results of the survey were as follows:

| | |
|------------------------------------|----------|
| Samples collected | 129 |
| Satisfactory samples | 74 (58%) |
| Doubtful samples | 8 (6%) |
| Adverse samples | 47 (36%) |
| Samples with fecal coliforms | 17 (13%) |

| | |
|--------------|---|
| Satisfactory | - total coliforms - 0 |
| | - fecal coliforms - 0 |
| Doubtful | - Total coliforms - 1-4 per 100 ml. |
| | - fecal coliforms - 0 |
| Adverse | - total coliforms - greater than 4/100 ml |
| | - fecal coliforms - present |

Every resident whose well was sampled and found to be doubtful or adverse was sent a letter by the Renfrew County Health Unit.

It was interesting to note that 80% of the wells with a coliform count (doubtful and adverse) were dug wells with depths varying generally from 10 to 15 feet. Dug wells are usually susceptible to contamination and this is especially true in older communities such as Killaloe Station. Over the years walls of the dug wells begin to fail along with the coverings, resulting in access of contaminated water into the ground water. Obtaining a satisfactory sample from a sanitary hand pump facility is difficult and this should be considered when interpreting the results. During the survey, bacteriological samples were collected from ten sanitary hand pump units and all were adverse.

After reviewing all compiled information it was concluded that if many of the present wells, especially dug wells, were constructed to present day standards the ground water supply would be satisfactory. By drilling wells it is also highly probable that an adequate supply would be obtained. Failing these suggestions, the present water supply if

unsatisfactory could be chlorinated continuously or water could be carried from a neighbours well.

Chemical samples were collected at random from a statistically representative number of wells and analyzed for hardness, iron, chloride, fluoride and nitrate. The results and interpretations are presented in Appendix One.

WATER QUALITY DATA AND DISCUSSION

Brennan's Creek and all other surface waters such as drainage courses within the village limits were sampled. The stations selected were the same as those selected in the 1969 survey.

Analyses on the samples were conducted at the Ministry of the Environment Laboratory in Toronto.

Unfortunately, the bacteriological samples collected on September 26, 1972 reached the laboratory three days after collection and therefore they had to be discarded. A second set of samples was collected on November 22, 1972, sent by bus to Toronto and again the company failed to notify our laboratory that the samples were at the terminal. These misfortunes prevented the publication of some very pertinent data. The results of bacteriological samples collected by the health unit staff and by Ministry staff during previous surveys will be used when comments are being made concerning the quality of water in Brennan's Creek and the surface drainage courses.

Upstream of the village generally the quality of water in Brennan's Creek was acceptable. High counts of coliform bacteria were however found at Cameron Street, the location selected to measure the input of contaminants to the creek from the village. Realizing that indeed the quality of water was being affected by certain discharges, staff endeavoured to pinpoint these sources.

The direct, indirect and potential sources of pollution to Brennan's Creek are as follows:

- a) Contaminants are gaining access to the storm sewer which discharges into the creek at the foot of Civic Street. It is impossible to state if there is a sanitary connection to the storm sewer or whether the contaminants are originating from the surface drainage area. External sources of pollution such as that from dogs, rodents, etc. could be washed into the storm sewer.
- b) At the time of the surveys, a flow was observed from the storm sewer located at the north west corner of Queen Street and Brennan's Creek. Based on the sample results, it is believed that sanitary sewer connections have been made to this storm sewer.
- c) Individual waste disposal systems for the premises located along the banks of the creek are highly suspicious. Rock is close to the surface, the slope of the land is very steep in certain areas and some lots are so small that it would be impossible to construct an adequate subsurface system.
- d) Between the two bridges (at Queen Street and Cameron Street) there are discharges of pollutants to the creek. Several outfalls can be observed along this reach of Brennan's Creek.
- e) The improved drainage ditch to the south bank of Brennan's Creek east of Cameron Street is also contributing to the degradation of the water. Leachate from subsurface systems along with external sources of pollution are gaining access to the drainage ditch.
- f) The urban development of the Village of Killaloe Station necessitated the development of a laundromat on the north shore of Brennan's Creek between Queen Street and Cameron Street. The adequate servicing of laundromats on the basis of septic tanks is generally not possible.



Storm sewer outfall to Brennan's Creek at Queen Street north east side.
Station Point Number BOB-50.2 W (N.E.)



Outfall to Brennan's Creek between Queen Street and Cameron Street bridges.
The outfall is behind the local hotel. Note close proximity of buildings
to creek and the lack of space for adequate subsurface systems.



Outfall to Brennan's Creek between Queen Street and Cameron Street bridges. Again note the adverse conditions for the installation of subsurface systems. Automatic flow recorder installed by the Ministry of the Environment.

In summary, wastes produced in the developing fringe of the village reach the natural waters with little or no treatment. This damaging effect to the water quality is illustrated in Appendix Two and Three.

PROPOSED MUNICIPAL SERVICES

The Village of Killaloe Station has entered into an agreement with the Ministry of the Environment to provide a municipal water and sewage system. The Ontario Municipal Board has scheduled January 4, 1973 for a hearing related to the two programs.

SUMMARY

A ground and surface water pollution survey was conducted in the Village of Killaloe Station on September 26, 1972. Similiar to previous surveys, staff found that sanitary wastes were gaining access to Brennan's Creek through local ditches, storm drains and direct discharges. The majority of the problems originated in the central built up area of the village and in the area east of the creek. Unless effective remedial action is taken to alleviate these conditions, a serious environmental problem could occur in the future. For these reasons we recommend that efforts be made to expedite the installation of the municipal sewer system.

It is not considered that there is a general ground water pollution problem although only 58% of the wells sampled were satisfactory. By properly constructing the present dilapidated dug wells, drilling new wells, individual chlorination or even communal sharing of satisfactory wells, the requirements of the residents could conceivably be met. The other alternative which will provide greater flexibility and growth potential within the municipality is to construct a public water works. It is recognized that the classification of these proposed improvements and associated costs are not always a clear cut choice and

that there is a grey area between the black and the white where choices tend to be somewhat arbitrary. The residents of the Village of Killaloe Station by their behaviour and related attitudes have expressed a feeling of satisfaction with the present individual water facilities. In addition, the cost implications of a communal water system have also raised objections among the residents. In light of the foregoing observations, it is recommended that the opinions and preferences of the residents be seriously considered.

There will indeed be inconveniences with the present water systems, etc. carrying water from well to house but if the people feel strongly against a municipal system and are willing to tolerate the present conditions, the writer feels a communal system should not be urged upon the municipality. Attempts must be made by the residents in their own interests to ensure that the quality of the domestic water is safe and palatable.

RECOMMENDATIONS

- 1) The municipality should continue with their efforts to ensure that a communal sewage system is installed at the earliest date possible.
- 2) Public preference should dictate the domestic water supply; a communal water system or individual private wells.

REPORT PREPARED BY:



R. A. Dunn, P. Eng.,
Sanitary Engineering Branch

RAD/lc

APPENDIX ONE

CHEMICAL RESULTS OF PRIVATE WELLS

| <u>Identification</u> | <u>Hardness as CaCO₃</u> | <u>Iron as Fe</u> | <u>Chloride as Cl</u> | <u>Fluoride as F</u> | <u>Nitrate as N</u> | <u>Comment</u> |
|-----------------------------------|---|-----------------------|---------------------------|--------------------------|-------------------------|-----------------------------|
| Mr. D. Abbott, Queen Street | 444 | 0.55 | 452 | 0.1 | 0.24 | Water not used for drinking |
| Killaloe Public School, Queen St. | 396 | 0.05 | 64 | 0.4 | 3.30 | Drilled well |
| Mr. E. Cybulski, Ryan Street | 388 | 0.10 | 166 | 0.1 | 1.8 | Dug well-Depth 15' |
| Mr. E. Gienow, Elm Street | 102 | 0.10 | 46 | 0.1 | 5.7 | Dug well-Depth 12' |

Notes:

- 1) All analyses reported in ppm.
- 2) High chloride content in Mr. Abbott's well prohibits use for domestic purposes.
- 3) Ground water in area generally very hard.
- 4) Ministry objective is 10.0 ppm as N.
- 5) Generally the chemical characteristics are satisfactory.

APPENDIX TWO

VILLAGE OF KILLALOE STATION - SURFACE WATER SAMPLE RESULTS

| <u>Sample Point Number</u> | <u>DESCRIPTION</u> | <u>Date</u> | <u>Total Coliforms per 100 ml</u> | <u>Fecal Coliforms per 100 ml</u> | <u>5 Day BOD</u> | <u>Suspended Solids</u> | <u>Total Kjeldahl as N</u> | <u>Total Phosphorus as P</u> | <u>Anionic Detergent As ABS</u> | <u>MBAS as LAS</u> |
|----------------------------|---|-------------|-----------------------------------|-----------------------------------|------------------|-------------------------|----------------------------|------------------------------|---------------------------------|--------------------|
| BOB49.87 | Brennan Creek downstream from Killaloe Station at Henry St. Launching area | Oct 19/65 | 500 | - | 0.6 | 4 | - | - | - | - |
| | | July 9/69 | 11,000+ | 11,000+ | 1.4 | 5 | 0.60 | 0.050 | 0.1 | - |
| | | Sept 26/72 | * | * | 0.4 | - | 0.55 | 0.052 | - | 0.1 |
| BOB49.95 | Improved ditch draining to South Bank of Brennan Creek east of Cameron Street | Oct 19/65 | 74,000 | - | 2.1 | 2 | - | - | - | - |
| | | July 10/69 | 11,000+ | 11,000+ | 9.0 | 70 | - | - | 0.6 | - |
| | | Sept 26/72 | * | * | 2.5 | - | 3.10 | 1.2 | - | 0.1 |
| BOB50.05D | Improved ditch draining to the north bank of Brennan Creek east of Cameron Street | Oct 19/65 | 230 | - | 4.8 | 18 | - | - | - | - |
| | | July 10/69 | 11,000+ | 11,000+ | 9.0 | 70 | - | - | - | - |
| | | Sept 26/72 | NO FLOW | | | | | | | |
| BOB50.1 | Brennan Creek at Cameron Street | Oct 19/65 | 2,000 | - | 1.1 | 1 | - | - | - | - |
| | | July 10/69 | 11,000+ | 11,000+ | 1.6 | 5 | 3.00 | 0.10 | 0.2 | - |
| | | Sept 26/72 | * | * | 1.0 | - | 0.70 | 0.060 | - | 0.1 |
| BOB50.14W | Storm sewer outfall to south bank of Brennan Creek west of Cameron Street | Oct 19/65 | NO FLOW | | | | | | | |
| | | July 10/69 | NO FLOW | | | | | | | |
| | | Sept 26/72 | NO FLOW | | | | | | | |
| BOB50.2 | Brennan Creek at Queen Street | Oct 19/65 | 700 | - | 1.6 | 2 | - | - | - | - |
| | | July 10/69 | 260 | 180 | 2.0 | 5 | 1.1 | 0.04 | 0.1 | - |
| | | Sept 26/72 | * | * | 0.6 | - | 0.056 | 0.034 | - | 0.1 |
| BOB50.2W (NW) | Storm sewer outfall to Brennan Creek at NW Side | Oct 19/65 | 7,000,000 | - | 20.0 | 194 | - | - | - | - |
| | | July 10/69 | 11,000+ | 11,000+ | 15.0 | 50 | - | - | 1.0 | - |
| | | Sept 26/72 | * | * | 7.0 | - | 4.6 | 11.00 | - | 0.1 |
| BOB50.2W (NE) | Storm sewer outfall to Brennan Creek at NE Side | Oct 19/65 | NO FLOW | | | | | | | |
| | | July 10/69 | NO FLOW | | | | | | | |
| | | Sept 26/72 | NO FLOW | | | | | | | |
| BOB50.2W (SW) | Storm sewer outfall to Brennan Creek at Queen Street SW Side | Oct 19/65 | NO FLOW | | | | | | | |
| | | July 10/69 | NO FLOW | | | | | | | |
| | | Sept 26/72 | NO FLOW | | | | | | | |

APPENDIX TWO (CONT'D)

| <u>Sample Point Number</u> | <u>Description</u> | <u>Date</u> | <u>Total Coliforms per 100 ml</u> | <u>Fecal Coliforms per 100 ml</u> | <u>5 Day BOD</u> | <u>Suspended Solids</u> | <u>Total Kjeldahl As N</u> | <u>Total Phosphorus as P</u> | <u>Anionic Detergent as ABS</u> | <u>MBAS as LAS</u> |
|------------------------------------|---|-------------|---|---|--------------------------|-----------------------------|------------------------------------|--------------------------------------|---|----------------------------|
| BOB50.2W (SE) | Storm sewer outfall to Creek at Queen Street SE side | Oct 19/65 | NO FLOW | | | | | | | |
| | | July 10/69 | NO FLOW | | | | | | | |
| | | Sept 26/72 | NO FLOW | | | | | | | |
| BOB50.22W | Submerged storm sewer outfall to Brennan Creek just west of Queen Street | Oct 19/65 | NO FLOW | | | | | | | |
| | | July 10/69 | NO FLOW | | | | | | | |
| | | Sept 26/72 | * | * | 0.8 | - | 0.02 | 0.028 | - | 0.1 |
| BOB50.27W | Storm sewer outfall to Brennan Creek at foot of Civic Street | Oct 19/65 | 6,000 | - | 4.8 | 7 | - | - | - | - |
| | | July 10/69 | 3,800 | 2,400 | - | - | - | - | - | - |
| | | Sept 26/72 | * | * | 1.0 | - | 0.75 | 0.180 | - | 0.1 |
| BOB50.92 | Brennan Creek upstream from Killaloe Station | Oct 19/65 | 74 | - | 0.5 | 2 | - | - | - | - |
| | | July 10/69 | 70 | 38 | 1.6 | 5 | 0.73 | 0.04 | 0 | - |
| | | Sept 26/72 | * | * | 0.6 | - | 0.72 | 0.48 | 0 | 0.1 |

* Samples collected but not analyzed due to time delay in reaching laboratory

APPENDIX THREE

BACTERIOLOGICAL RESULTS OF SAMPLES COLLECTED

BY THE RENFREW COUNTY HEALTH UNIT

VILLAGE OF KILLALOE STATION

| <u>Date</u> | <u>Location</u> | <u>Total Coliforms per 100 ml.</u> | <u>Fecal Coliforms per 100 ml.</u> |
|-----------------|-----------------|--|--|
| July 21, 1969 | BOB 50.27 | 90 | 82 |
| July 21, 1969 | BOB 50.10 | 11,000 + | 11,000 + |
| August 12, 1969 | BOB 50.27 | 210 | 160 |
| August 12, 1969 | BOB 50.10 | 11,000 + | 11,000 + |
| August 26, 1969 | BOB 50.27 | 1,000 | 260 |
| August 26, 1969 | BOB 50.10 | 11,000 + | 3,500 |
| July 9, 1971 | BOB 50.27 | 145 | 80 |
| July 9, 1971 | BOB 50.10 | 140 | 100 |
| July 14, 1971 | BOB 50. 27 | 115 | 40 |
| July 14, 1971 | BOB 50.10 | 285 | 40 |
| July 21, 1971 | BOB 50.27 | 1,200 | 1,200 |
| July 21, 1971 | BOB 50.10 | 8,000 + | 7,900 |
| July 28, 1971 | BOB 50.27 | 75 | 22 |
| July 28, 1971 | BOB 50.10 | 8,000 + | 8,000 + |
| August 6, 1971 | BOB 50.27 | 1,000 | 0 |
| August 6, 1971 | BOB 50.10 | 1,400 | 800 |
| August 16, 1971 | BOB 50.27 | 1,200 | 800 |
| August 16, 1971 | BOB 50.10 | 1,100 | 116 |
| August 20, 1971 | BOB 50.27 | 35 | 10 |
| August 20, 1971 | BOB 50.10 | 4,700 | 3,800 |

Sampling station BOB 50.27 at the falls was selected as representing generally the upstream conditions while BOB 50.10 at Cameron Street Bridge represents generally the downstream conditions. By the above results it is clearly evident that there are discharges of waste to the creek.

APPENDIX FOUR

CHEMICAL ANALYSES OF SURFACE WATER

BRENNAN'S CREEK AT DAM

| | |
|-----------------------|------|
| Hardness | 98 |
| Alkalinity | 86 |
| Iron | 0.25 |
| Chloride | 2 |
| pH at Lab | 7.9 |
| Fluoride | 0.1 |
| Apparent colour units | 100 |
| Turbidity units | 6 |
| Nitrate as N | 0.1 |
| Magnesium as Mg | 4 |
| Zinc as Zn | 0.05 |
| Arsenic as As | 0.00 |
| Selenium as Se | 1.00 |
| Copper as Cu | 0.02 |
| Cadmium as Cd | 0.01 |
| Chromium as Cr | 0.02 |
| Silver as Ag | 0.00 |
| Cyanide as HCN | 0.01 |
| Phenols as ppb | 25 |

NB: All results in ppm unless otherwise indicated.

APPENDIX FIVE

INTERPRETATION AND SIGNIFICANCE OF LABORATORY RESULTS

The analyses employed to assess the water quality of the samples collected during this survey were: Biochemical Oxygen Demand BOD, suspended solids, total kjeldahl, nitrogen, total phosphorus, anionic detergents as Alkyl Benzene Sulphorate (ABS) and Methylene Blue Active.

BACTERIOLOGICAL EXAMINATION

The bacteriological indicators of contamination used during the survey were the total and fecal coliform organisms. Coliform organisms are found in human excrement, animal excrement and the soil. The fecal coliforms are indicators of human or animal wastes.

SANITARY CHEMICAL ANALYSES

Biochemical Oxygen Demand (BOD)

This test evaluates the loss of dissolved oxygen that accompanies the decomposition of organic matter carried out by organisms. It is an indirect measure of the amount of decomposable matter present and the direct measure of the respiratory oxygen requirement of the living organisms responsible for decomposition. A 5-day BOD determination with incubation at 20°C is reported. A high BOD is indicative of organic or chemical pollution. In most cases adequate protection for surface waters should be provided if BOD concentrations in waste discharges exceed 15 ppm, but in some cases a much higher concentration can be tolerated while in other cases a concentration less than 15 ppm could be detrimental. Special situations have to be examined individually. This will ensure that the biochemical oxygen demand from the various sources does not lower the oxygen concentration in the watercourse below 6 - 7 mg/litre and thus make the watercourse unacceptable for various fresh water biota.

Suspended Solids

The suspended solids value is the most significant of the solids determination and indicates the measure of the undissolved solids of organic or inorganic nature. The effects of suspended solids in water are reflected in difficulties associated with water purification depositions in streams and injury to the habitat of fish. In most cases, adequate protection for surface waters should be provided if suspended solids concentrations in waste discharges exceed 15 ppm.

Total Kjeldahl Nitrogen

Kjeldahl nitrogen is the sum of the nitrogen present in the ammonia and organic forms (it does not include nitrate or nitrite). The total kjeldahl determinations are important in determining the availability of nitrogen for biological utilization.

Total Phosphorus

Phosphorus is an essential plant nutrient and is believed to play an important role in the deterioration of the quality of natural waterways by promoting an overabundance of plants. It occurs in natural and waste waters in several different chemical combinations, such as orthophosphate (PO_4), organic phosphates and polyphosphates. Since most or all of these forms can eventually be used by plants and animals, determination of the total phosphorus concentration is more relevant than measurement of individual phosphorus compounds.

A mean value for total phosphorus of 0.02 mg/litre or greater indicates that troublesome levels of algae could materialize.

Anionic Detergents (as Alkyl Benzene Sulphonate (A.B.S.))

The presence of detergents in natural waters usually indicates contamination by domestic wastes. While A.B.S. is not toxic to most biota at low levels, it can be objectionable because of the foaming it may cause.

Samples which do not produce any foam when shaken vigorously contain less than 0.5 mgms per l. This is the objective for natural waters, and it is not necessary to request A.B.S. analysis on samples if shaking does not induce a perceptible foam.

The results include both A.B.S. and the recently introduced "linear" forms L.A.S., although pure A.B.S. is used to calibrate the test and the results are expressed in these terms.

Methylene Blue Active Substances as Linear Alkylate Sulphate MBAS as LAS

Sufficient time has elapsed since the substitution of LAS for ABS in household detergents that all stocks in current domestic use may now be safely presumed to contain only LAS. Thus the anionic surfactants appearing in sewage from domestic sources are now almost certainly LAS.

The test therefore does not identify the anionic detergent (or possible interferences) which may be present. It merely determines that there is some anionic detergent or other substance present which causes a certain degree of color reaction in the test. In the past, ABS was arbitrarily selected as the reference material, and the anionic detergent content of a sample was expressed as 'ABS' whether or not ABS or some other anionic detergent was in fact present. It is now preferable to arbitrarily select LAS as the reference material, since the domestic detergents currently in use may logically be presumed to contain mainly LAS. Due to the difference in the response of the methylene blue test to these arbitrary reference materials, results now calculated as mg/litre as 'LAS' will be 9% lower than if they were calculated as 'ABS'. This should be taken into account when comparing current with past results.



LEGEND

- B.O.B.-49.87 - STREAM SAMPLING POINT SHOWING MILEAGE
- B.O.B.-49.95 D - OUTFALL SHOWING STREAM AND MILEAGE TYPE OF OUTFALL
- D - DITCH
- W - STORM SEWER

ONTARIO WATER RESOURCES COMMISSION

VILLAGE OF KILLALOE STATION
WATER POLLUTION SURVEY
1972

SCALE: 1" = 300'

DRAWN BY: M. Super

DATE: AUGUST, 1969

CHECKED BY: R. W.

DRAWING No: 69-103-DE.